

Lesson 1: DOG OBSTACLE COURSE

🕒 45 – 90 min

Build an obstacle course for dogs! The course contains at least two different types of obstacles for dog figures to run through, over, under, or around. Students won't be given building instructions but should instead use the picture on page 1 in their building instructions books as guidance. They can copy the models in the picture on pages 2 and 3 of



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building instructions book "A," embellish them or invent their own designs. Describe the push and pull forces that are at work. This lesson will help familiarize your students with the contents of the LEGO® Education BricQ Motion Essential Set. It is recommended to take some time before the lesson to show students what's beneath the white tray and to explain that the bricks are sorted by color. Also, it is a good time to show students how to use the Brick Separator to remove stuck bricks. Students will find the building instructions books under the tray. They'll only need book "A" for this unit.

Key Objectives

Students will:

- become familiar with using this set to build models
- explore how pushing and pulling effects an object's motion.

Educational Standards

Norwegian:

[Naturfag etter 4.trinn – NAT0004:](#)

- undre seg, stille spørsmål og lage hypoteser og utforske disse for å finne svar
- sammenligne modeller med observasjoner og samtale om hvorfor vi bruker modeller i naturfag

USA:

- NGSS K-PS2-2 [Motion and Stability: Forces and Interactions](#)
- NGSS K-2-ETS1-1 [Engineering Design](#)
- ISTE 1.7C [Global Collaborator](#)

Things Needed

- LEGO® Education [BricQ Motion Essential](#) Sets (one for every two students);
- Building instructions book "[A,](#)" [pages 2-3](#);
- Screen to project the related video and information;

Self-Assessment Have each student choose the brick that they feel best represents their performance:

- **Green:** I think I can explain what "push" and "pull" mean.
- **Blue:** I know I can explain what "push" and "pull" mean.
- **Purple:** I can explain what "push" and "pull" mean and help a friend understand, too.

LESSON PLAN

Engage	Whole Class, 10 Minutes	<p>Facilitate a quick discussion about obstacle courses and dogs.</p> <ul style="list-style-type: none"> • What’s an obstacle course? • Have you ever tried an obstacle course? What obstacles did you try? • How did your body move through the obstacles? Did it push or pull? Climb over or under? Go through or around? <p>Ask if anyone in the classroom has a dog or knows someone who has one - how do they train a dog?</p> <ul style="list-style-type: none"> • Show the video: <div style="text-align: center;">  <p><i>Source 2 LEGO® Education</i></p> </div> • Ask questions like: <ul style="list-style-type: none"> - What types of training obstacles did you see in the video? - How did the dogs react to them? • Tell the students that they'll be building an obstacle course (of at least two different types of obstacles) for dogs to run through, over, under, or around, using the LEGO® Education BricQ Motion Essential Set in front of them. • Before explaining the objective of this lesson, review the concepts of push and pull forces and how they affect the objects they interact with. Act the examples out using the LEGO® bricks. • Explain that they won't be given building instructions but should instead use the picture on page 2 in their building instructions books as guidance. They can copy the models in the picture on page 2 of building instructions book "A," embellish them or invent their own designs.
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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Explore</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Small Groups, 15 Minutes</p>	<p>Students work in pairs to design and build an obstacle course containing two different types of obstacles for dogs. There aren't specific building instructions for this lesson. However, students can refer to the picture on page 2 of the building instructions book "A" for inspiration. They're also welcome to design their own models.</p> <ul style="list-style-type: none"> • Advise students to take some time to draw the design(s) on a sheet of paper, discuss the design process plan, and/ or even assign the roles and/ or designs. <p><i>Note:</i> There aren't enough elements to simultaneously build all the models in the inspiration picture.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Role-playing</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Small Groups, 5 Minutes</p>	<p>Once the students have finished building, encourage them to line up their obstacles and run their dogs through the course.</p> <ul style="list-style-type: none"> • Explain to students that one child should play the role of the human miniature figure, narrating the run through the obstacle course, e.g., <i>push/pull, up/down, over/under, through, across, around</i>, and the other child should play the role of an animal miniature figure, following the given commands. <p>Encourage students to name miniature figures and/ or even develop a short story for this role-play.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Explain</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Whole Class, 5 Minutes</p>	<p>Gather your students together to share what they've built. Ask questions like:</p> <ul style="list-style-type: none"> • How does the dog move through your obstacle course? (e.g., <i>push/pull, up/down, over/under, through, across, around.</i>) • Have you seen any other push and pull forces today? • Which obstacles require a push and/ or pulling? (e.g., In the "round treadmill" obstacle, you push forward and pull back the green "wheel" to push (spin) the blue "wheel" with the dog on top of it. Seesaw is also a great obstacle to emphasize pushing and pulling. <p>Relate to the students who do not have dogs and ask if obstacle courses can be built for people. Ask to explain why people use obstacle courses for. For example, people build obstacle courses to train themselves to perform better physically.</p>



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Elaborate	Whole Class, 10 Minutes	<p>Have students continue to recreate/ invent and build one or two more obstacle (s). Students can use the inspirational designs on page 3 of the building instructions book "A." Encourage the students to explore their models' movement as they build. If time allows, have the groups combine all of their models to create a bigger obstacle course. Then ask them to explain which parts are pushing/ pulling others. In the "fetch" obstacle, you pull back the spring to push and launch the ball. In the "dog sled" obstacle, where the dogs pull the sled along.</p> <p>Once done, ask the students to disassemble their models, sort the bricks back into the trays, and clean up their workstations. Remind the students to check the floor for dropped elements and to put them back where they belong.</p> <p>Inspire kids to make an obstacle course at home using pillows, blankets, or other household items. Ask them to share their experience before next lesson.</p>
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Self-Assessment

Have each student choose the brick that they feel best represents their performance:

- Green: I think I can explain what "push" and "pull" mean.
- Blue: I know I can explain what "push" and "pull" mean.
- Purple: I can explain what "push" and "pull" mean and help a friend understand, too.

Peer-Feedback

In their small groups, have the students discuss their experiences working as a group. Encourage them to use statements like:

- I liked it when you....
- I'd like to hear more about when you....

Challenge	Whole Class, 20 Minutes	<p>Increase the difficulty by:</p> <ul style="list-style-type: none"> • challenging the students to design even more training obstacles, including moving, spinning, tilting, or rolling parts. • for advanced builders, pull out a random element and ask them to find a way to use it in a model. <p>Advise students to take the time to draw the design on a sheet of paper, discuss the design process plan, and/ or even assign the roles and/ or designs.</p>
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Cross-curricular extension	Small groups, 15 Minutes	<p>To incorporate language arts skills development:</p> <ul style="list-style-type: none"> • have the students work individually and write an announcer’s script narrating their dog’s run through their two-piece obstacle course, i.e.: <i>Let’s go, Buddy. You can do it; jump through the hole. Now, this way. Step on it and walk over it.</i> • each student should explain to each other which parts are pushing/ pulling others. • ask the students to role-play each script and make the necessary changes to clarify the commands and better the dog’s understanding.
Demonstration of Knowledge	Whole class, 10 Minutes	<p>Invite volunteers to demonstrate what they have learned throughout the lesson with their peers and explain how pushing and pulling interact with objects. Students can use built random brick models to demonstrate their explanations for visual learners.</p> <p>Once done, ask the students to disassemble their models, sort the bricks back into the trays, and clean up their workstations. Remind the students to check the floor for dropped elements and to put them back where they belong.</p>

Self-Assessment

Have each student choose the brick that they feel best represents their performance:

- Green: I think I can explain what "push" and "pull" mean.
- Blue: I know I can explain what "push" and "pull" mean.
- Purple: I can explain what "push" and "pull" mean and help a friend understand, too.

Peer-Feedback

In their small groups, have the students discuss their experiences working as a group. Encourage them to use statements like:

- I have noticed you improved...
- I'd like to hear more about when you....

Sources:

1. *Dog Obstacle Course*, LEGO® Education <https://education.lego.com/en-us/lessons/bricq-motion-train-to-win/dog-obstacle-course#prepare> Accessed: 11/21/2022